ET-100

EXTREMA MACHINERY COMPANY, INC.

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GENERAL SAFETY RULES

There is a certain amount of hazard involved with the use of woodworking machinery. Using the machine with the respect and caution demanded as far as safety precautions are

concerned will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, severe personal injury to the operator can occur.

1. Read the operation manual before operating this machine.
2. If you are not thoroughly familiar with the machine operation, obtain advice from a supervisor or other qualified person.
3. The machine should be disconnected from the power source before performing maintenance or adjustments to the internal mechanisms, or when making repairs.
4. After maintenance job is finished, check to see if there are any tools or objects left on the machine. Close all safety guards.
5. Before leaving the machine, make sure the work area is clean.
6. Check timber for loose knots, nails, or other items, which may cause a hazard or affect the machine's performance.
7. Learn the machine's applications and limitations, as well as the specific potential hazards peculiar to it. Keep the machine in top condition for best and safest performance.
8. Keep all guards in place and in working order.
9. Do not force the machine. It will do the job better and be safer working at the rate for which it was designed.
10. All children and visitors should be kept a safe distance from the working area.
11. The operator should keep proper footing and balance at all times.
12. Do not operate the machine while under the influence of drugs, alcohol, or any other medication.
13. Avoid awkward operations and hand positions where a sudden slip could cause your hand to move into the machine.
14. Never leave the machine until it comes to a complete stop, and never leave the machine running unattended.
15. The employer is responsible for selecting competent and qualified employees.
16. The employer must make sure that employees study and utilize this safety information.
17. Supervisors must alert personnel of any unsafe practices they observe.
18. All employees should be aware of first aid facilities and be encouraged to use them, regardless of the severity of the injury.
19. Fire prevention must be practiced and fire protection must be available to prevent loss of life, personal injury, and property damage.
20. Safety shoes should be worn to provide protection against rolling objects, falling objects, and sharp edges in the workplace.
21. Eye protection should be worn and such devices should be carefully selected, fitted and used. Compulsory wearing of glasses with impact resistant lenses and side shields is a good safety policy. All eye protection should conform to ANSI 87 standards.
22. Wear hearing protection when operating the machine.
23. Do not wear rings, necklaces or jewelry around moving machinery.
24. Do not wear loose fitting clothes. Clothing should be comfortable, but long sleeves, neckties, etc. should not be worn.
25. Do not wear gloves or other hand covering articles around moving machinery.
26. Cover long hair with a hair net or cap.
27. Protective guards and shields must be in place at all times unless they must be removed for specific service or maintenance. They should be immediately replaced when service or maintenance is completed.
28. Make sure that operator clearly knows how to stop the machine before starting work.
29. Never clean or remove chips while the machine is running.

30. Maintain the machine in good operating condition. Report unusual conditions or machine malfunctions immediately.
31. Do not alter or remove guards and warning labels.
32. Keep the immediate area clean. Do not allow the floor to become slippery, or covered with dust or obstacles. Dust that accumulates in the work area is a hazard that can cause you to fall or slip against the machine or its controls.
33. Employees should be required to report to their supervisors any hazardous condition of the machine or in the immediate area.

SHIPPING & RECEIVING INSTRUCTIONS

This machine has been carefully inspected and tested before packing. It was delivered in good condition and was shipped in one wooden pallet.

When receiving this machine, inspect the wooden pallet and check to see if there is any damage. Then check the machine model and all items as according to the packing list.

If there is any damage on the machine or any missing parts, report it to your local distributor or the machine manufacturer immediately.

UNPACKING & CHECKING CONTENTS

The machine has been well packed at the manufacturer's factory and shipped in good condition. The machine is shipped on one wooden pallet.

Upon receiving the machine, carefully unpack it and check all items as according to the packing list.

If you find any part is missed or damaged, contact your local distributor or the manufacturer of the machine immediately. Do not attempt to operate the machine until the missing parts are obtained and are installed correctly.

CLEANING THE MACHINE

The machine is coated with rust preventative oil before shipment. When the machine has been moved to the proper work site, wipe the oil from the machine using a saft cloth soaked in kerosene. Do not use gasoline, lacquer thinner, or any other volatile solvent, as these may damage the paint surface of the machine.

LIFTING THE MACHINE

The machine should be lifted or moved by a forklift. Make sure the loading capacity of the forklift is sufficient to raise the machine. Pay special attention to the machine balance while

lifting the machine to prevent the machine from falling. The forks of the forklift must protrude over the machine bottom for uniform distribution of the entire machine weight.

ELECTRICAL SAFETY RULES

1. Do not alter or bypass any protective interlock.
2. Before starting the machine, read and observe all warning labels and markings such as nameplates and identification plates.
3. Only personnel who are properly trained and have adequate knowledge and skill should undertake all electrical/electronic troubleshooting and repair.
4. Use extra precautions in damp areas to prevent yourself from accidental grounding.
5. Make sure your body and your tools are clear of electrical grounding.
6. The control panel doors should be opened only when it is necessary to check the electrical equipment or electrical wiring.
7. Before applying power to any equipment, establish without a doubt that all persons are clear.
8. Be alert and be sure you can work with no outside distractions.
9. Avoid wearing metal frame glasses or wearing a metallic necklace or chain, and never work on electrical equipment while wearing rings, watches, or bracelets.
10. When replacing conductors, make sure they conform to the manufacturer's specifications, including proper color-coding.
11. Do not alter the electrical circuits. If machine damage is caused by an unauthorized alteration, the user is responsible, not the manufacturer.
12. Always assume the electrical power is ON and treat circuit as live. This caution develops a habit that may prevent an accident.
13. Give capacitors time to discharge. Otherwise, it should be done manually with care.
14. Use proper test equipment to make certain you have an open circuit. Test equipment must be checked and calibrated at regular intervals.
15. Open the control panel doors only when it is necessary to check the electrical equipment or wiring. After closing the door, make sure the disconnecting means are operating with the disconnecting handle mechanism in its proper position.
16. All covers on junction boxes must be closed before leaving any job.

SPECIFICATIONS

Spindle Capacity:	
½" (under nut)	2-½"
¾" (under nut)	3"
1" (under nut)	4"
1-¼" (under nut)	4-½"
Spindle Travel	3"
Spindle Speeds	7,500 RPM & 10,000 RPM (2 speeds)
Table Size	29" x 23"
Table Height	35"
Table Insert Opening Diameter	6-⅜"
Fence Size	3-¾" x 13"
Motor	3 HP 1∅; 5HP 3∅

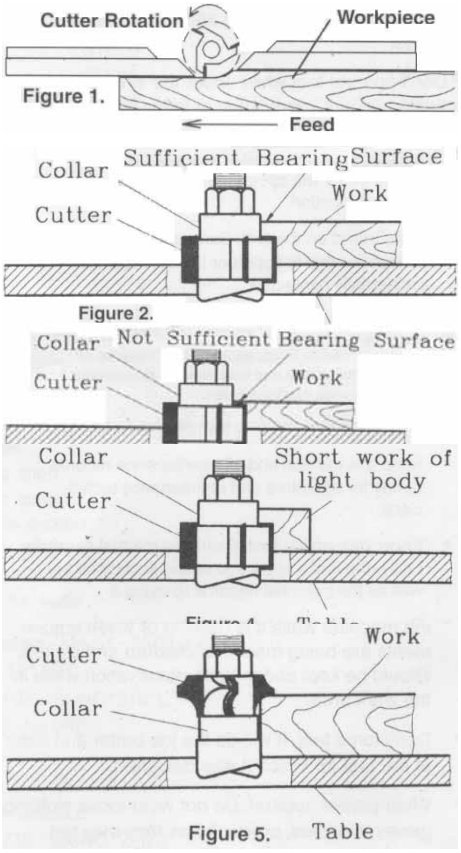
! WARNING

- Installation, operation, and maintenance of your wood shaper must be done in accordance with all codes and acts for your personal safety. Trained and experienced equipment installers should install the machine.
- Keep the floor area around the machine clean and free of chips, liquids, stock material or anything else that may prevent the operator from using the machine safely.
- Disconnect machine from electrical power before performing any maintenance.
- Check that the power switch is in the OFF position before connecting machine to power.
- Give your work your full attention. Horseplay, looking around, and carrying on a conversation while using the machine are careless acts that can result in serious injury.
- Keep this manual and all maintenance records handy for operators and maintenance technicians.
- Know your power tool. Read this manual carefully. Learn the tool's applications and limitations as well as the potential hazards to using it.
- Remove adjusting keys and wrenches after making adjustments.
- Avoid working in a dangerous environment. Don't use power tools in damp or wet locations or expose them to rain. Work only in a well lit area.
- Keep children and visitors a safe distance from the machine while it is running or when adjustments are being made. All children and visitors should be kept under close observation while in the work area.
- Don't force tool. It will do the job better and safer at the rate for which it was designed.
- Wear proper apparel. Do not wear loose clothing, gloves, neckties, or jewelry as they may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
- Use safety glasses. Also, use face or dust masks if cutting operation is dusty. If eyeglasses only have impact resistant lenses, they are not safety glasses.
- Secure work. Use clamps to hold work when practical. It's safer than using your hands and frees both hands to operate tool or hold the work piece. Use a push-stick to feed work piece whenever possible or when feeding smaller work pieces that do not allow a reasonable clearance between cutterhead and hands.
- Don't overreach. Always keep proper footing and balance.
- Feed work into a cutter or bit against the direction of rotation of the cutter or bit only.

- Replace all obscured or missing warning labels.
- Keep guards in place and in working order.
- Stop machine to remove chips and scrap.
- Disconnect tools before servicing and when changing accessories such as cutters, arbors, and adapters.
- Maintain tools in top condition. Keep bits sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- Don't operate tool while under the influence of drugs, alcohol, medication or fatigued.
- Never leave a tool running unattended. Turn power off and don't leave tool until it comes to a complete stop.
- Check for alignment and binding of moving parts, broken or missing parts, and any other conditions that may affect operation.
- Check for damaged parts. A guard or other part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function.
- Never stand on the tool. Serious injuries could occur if the tool is tipped or the cutting bit is accidentally contacted.
- Use recommended accessories. Consult the manual for recommended accessories. The improper accessories may expose operator to risk of injury.

ADDITIONAL SAFETY RULES FOR SHAPER

- Never run stock between the fence and cutterhead.
- The fence should be adjusted so the opening is never more than is required to clear the cutter.
- Always use a miter gauge and clamp attachment when edge shaping work less than 6" wide.
- Be sure the special arbor nut and the draw bar are tightened.
- Check that the keyed collar and washer are directly under the arbor hex socket head screw and arbor screw is tight.
- Release the main spindle from the locking mandrel lever before starting machine.
- Always feed stock against cutter rotation as shown in Fig. 1.
- When shaping with collars and starting pin, the work piece must have sufficient bearing surface and be fairly heavy in proportion to the cut being made as shown in Fig. 2.
- Fig. 3 illustrates the wrong way for this operation as the collar does not have sufficient bearing surface.
- Short, light work with poor bearing surface as shown in Fig. 4 is extremely dangerous and should never be attempted.
- When shaping with collars and starting pin, the cutter should be positioned below the collar whenever possible, as shown in Fig. 5.



PREINSTALLATION CLEANING & CHECKING

For maximum performance and safety from your spindle shaper, clean and check it carefully before installation.

Inspect the packing crate for physical or water damage. Immediately contact the shipper if any damage is noted.

After opening the packaging, check that all parts are present and undamaged. Check the specification plate on the shaper to confirm the correct model shaper has been shipped to you.

Check that all shipping packaging is removed from the shaper, particularly in and around all moving parts. Remove all tape, wire, tags, and any other foreign materials.

Clean the shaper using products suitable for removing protective coatings. Do not use solvents on plastic parts or electrical cord or damage may result.

Before lifting machine, remove all foot bolts locking it to the shipping base.

Transport the machine to the installation site using a hand truck or dolly suitable for the weight.

INSTALLATION & LEVELING

The spindle shaper comes assembled except for an interchangeable arbor, work hold-down guides, handle and fixing rod on the fence assembly.

Select a well illuminated installation site with a solid, level surface with plenty of room to maneuver the work piece.

Level machine in both directions using metal shims, if needed. Check that all four corners are properly supported. If machine is not to be bolted to the floor, make sure it rests solidly after leveling.

ELECTRICAL INSTALLATION

All wiring must conform to state and local codes.

Check the voltage specification located on the motor, specification plate or tagged to the power cord. Connecting the shaper to the improper voltage may expose installation personnel and operators to a serious electrical hazard and damage the electrical components. Low voltage will damage the motor. The machine is shipped with a 3-wire power cord that must be terminated by the installer. The green wire is the ground wire.

Connect the shaper to a grounded, metal-enclosed wiring system or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the spindle shaper.

A trained, experienced electrician must check the final electrical connections.

Double-check that the machine is properly grounded.

ELECTRICAL CONTROLS

The spindle shaper is equipped with a push button control system and reversing switch. The green start and red stop push buttons mounted in a control enclosure on the front of the machine (A in fig. 6).

! CAUTION Release the main spindle from the locking mandrel lever before starting machine.

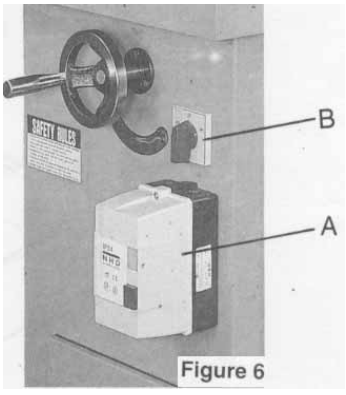


Figure 6

To reverse the rotation of the spindle, simply shut off the motor, wait until it comes to a complete stop, and rotate the reversing switch (B in fig. 6).

! CAUTION Do not operate the reverse switch while the motor is running. Wait until the spindle comes to a complete stop before rotating the reversing switch.

NOTE: The red stop button on the push button control system (A in fig. 6) also acts as an overload reset button. If overload should trip, reset by depressing red stop button.

ADJUSTING & OPERATING YOUR SHAPER

Disconnect machine from the power source before adjusting this machine.

Speed Change & Belt Adjustment

Your shaper is equipped with two speed pulleys (A) fig. 8, and the upper pulley groove-speed 7,500 RPM; lower pulley groove-speed 10,000 RPM. To change the speed and adjust the proper tension proceeds as follows:

1. Disconnect machine from the power source.
2. Open the front door.
3. Loosen the fixing knob, Fig. 7.
4. Loosen the tension on the belt by turning the v-belt tension hand wheel to release the belt. Then move the belt on the other pulley groove.
5. Turn the knob (C), to adjust the belt tension properly. Correct tension is obtained when there is approximately ¼" defection of the belt at the center span of the pulleys using light finger pressure.
6. Tighten the fixing knob (B), with hand.
7. Close the front door.

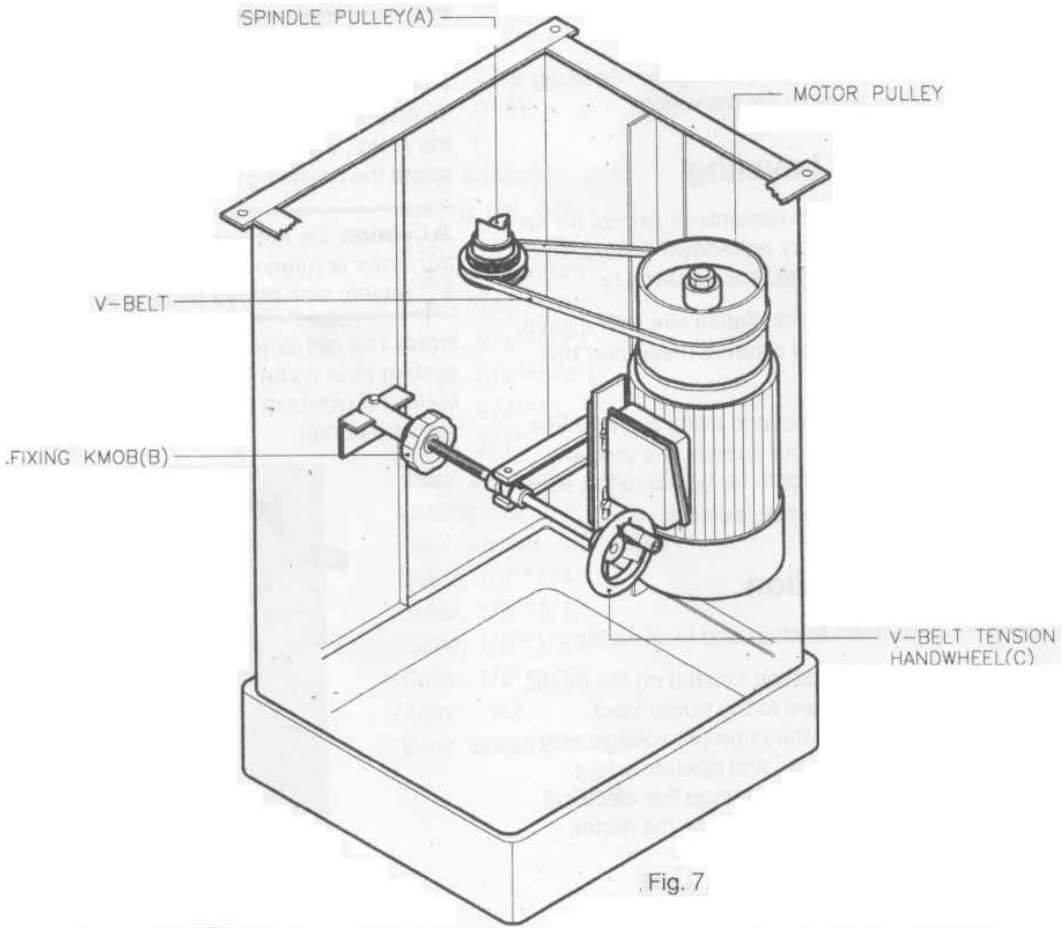


Fig. 7

ARBOR INSTALLATION & REPLACEMENT

The arbor is held in main spindle with draw bar and readily interchangeable. To install the arbor proceed as follows:

1. Disconnect machine from the power source.
2. Push turning spindle lock (A) into the pulley lock hole. (Pulley per hole 180°) (Fig. 8)
3. Select the size of arbor required. Clean the arbor shank and bore of the main spindle.
4. Insert arbor into spindle, make sure the key (B), in the spindle is engaged with notch (C) in the arbor. (Fig. 9)
5. Thread end of the draw bar (D) through cartridge into the thread hole in the bottom of the spindle (E). (Fig. 10)
6. Tighten nut (F) on draw bar (D) to fasten arbor to spindle. (Fig. 11)

NOTE: When finish assembled and changed arbor, don't forget to loosen spindle lock (A).

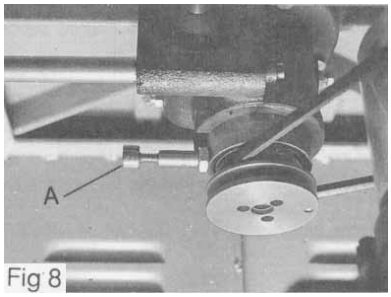


Fig 8

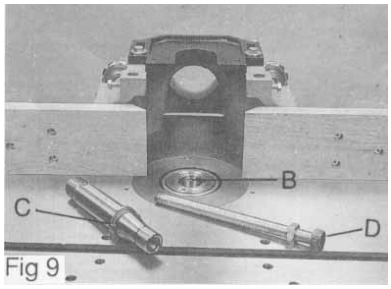


Fig 9

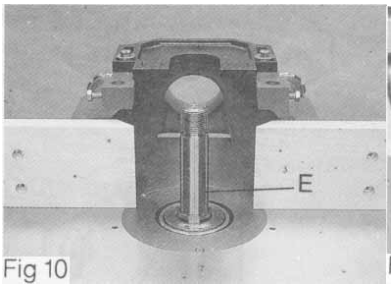


Fig 10

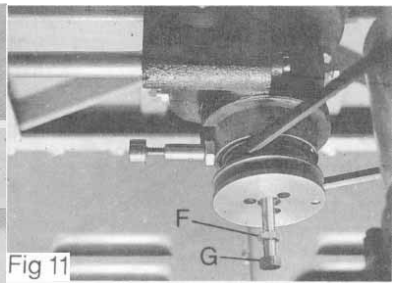


Fig 11

INSTALL NEW CUTTER

Disconnect machine from the power source and proceed as follows:

1. Move the entire fence, select the cutter to be used.
2. Open the front door. Push, turning spindle lock to lock the spindle.
3. Release lock nut, take off collars, and place the cutter on the arbor at the proper height. Make sure that the cutter rotates towards the work to be cut.
4. Tighten the lock nut to lock arbor securely in place.

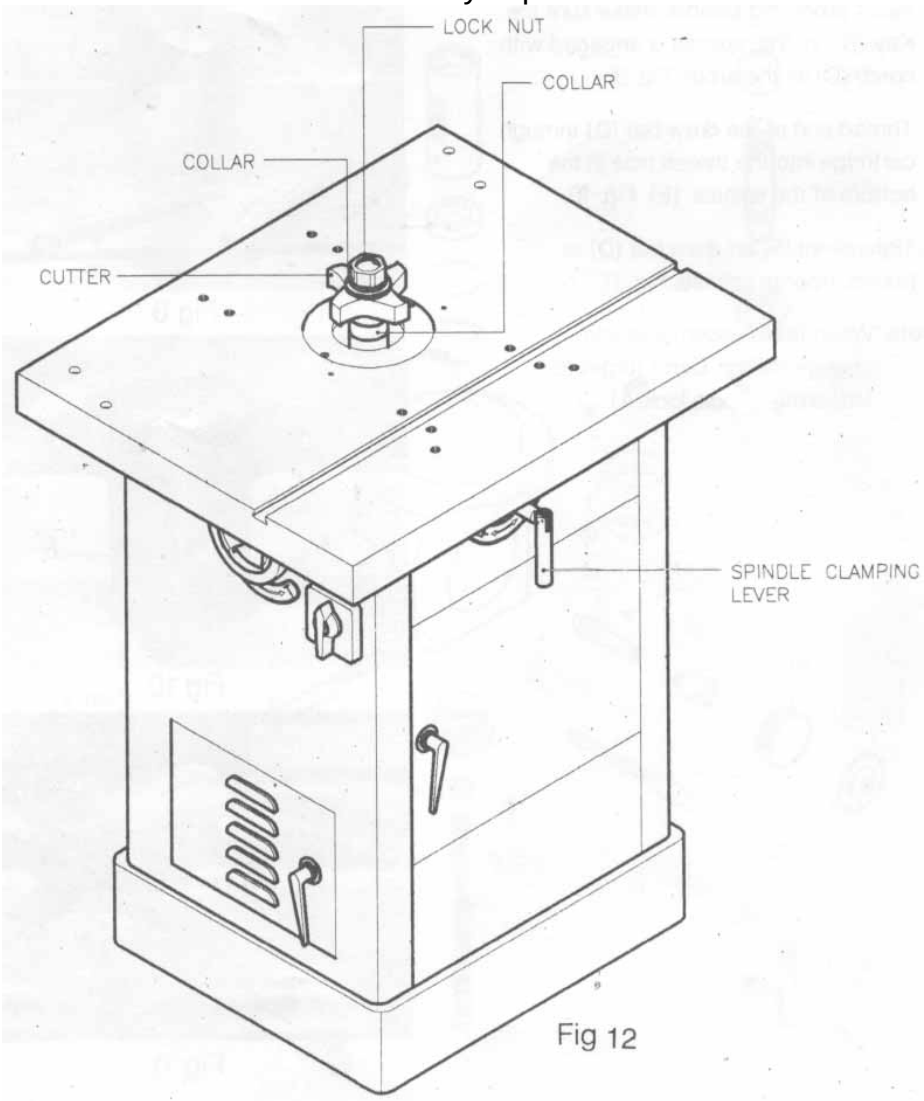


Fig 12

TO RAISE OR LOWER THE SPINDLE

The spindle is raised and lowered with the spindle raising hand wheel. Loosen the clamping lever and turn the hand wheel.

Always tighten the clamping lever after raising or lowering the spindle. (Fig. 13)

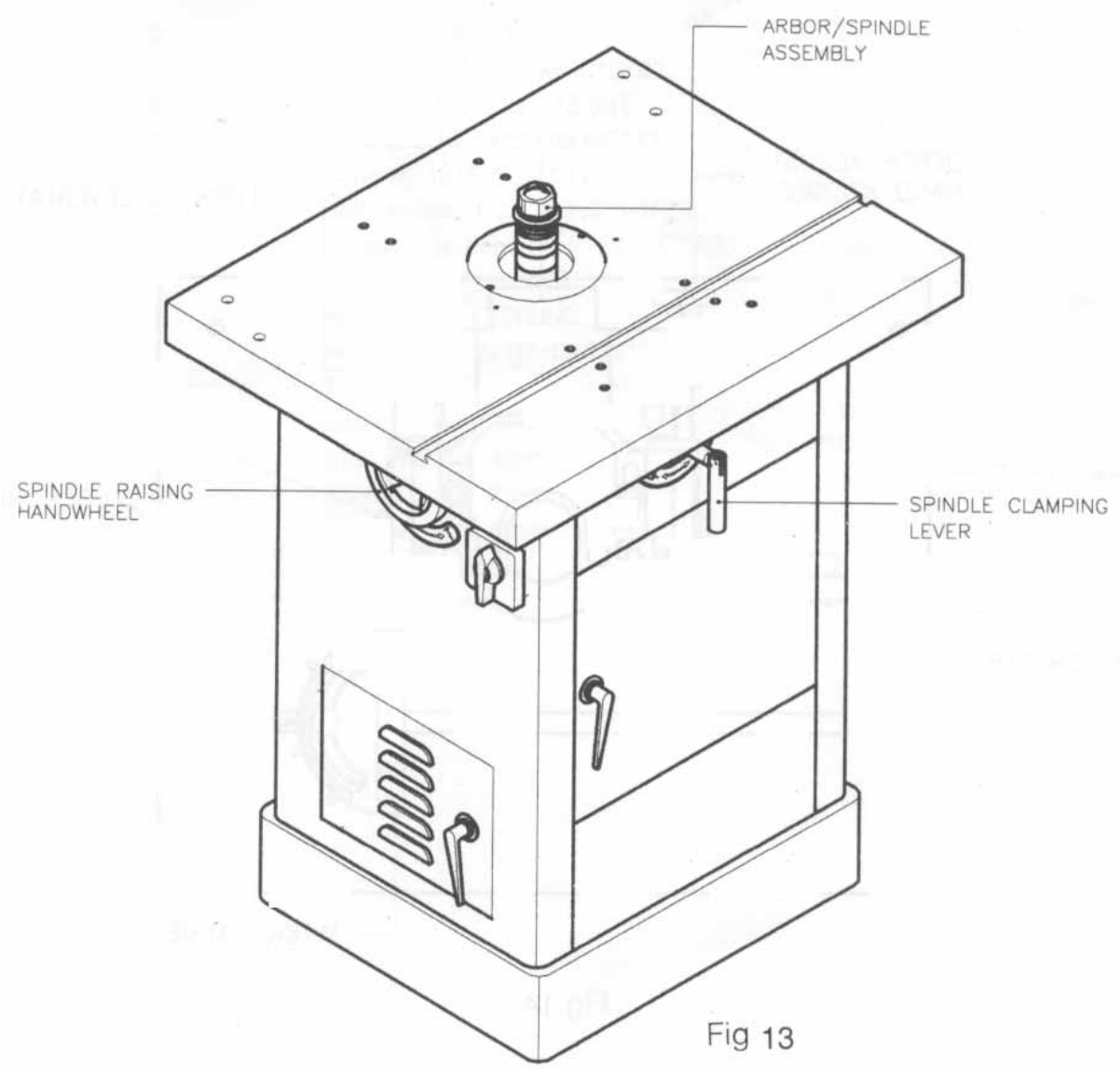


Fig 13

FENCE OPERATION

Two fence lock levers (A) are used to lock the fence assembly to the worktable. To set the right half of the fence for any required depth of cut, loosen right half of fence lock screw (E), move the right facing to the required depth of cut by turning depth adjust knob (C). Remember to retighten the screw (E) after adjustment is finished.

To adjust the opening between facings, loosen 3 lock nuts (D) on each facing. Slide the facing to the proper position. Always remember to retighten lock nuts after adjustment is finished.

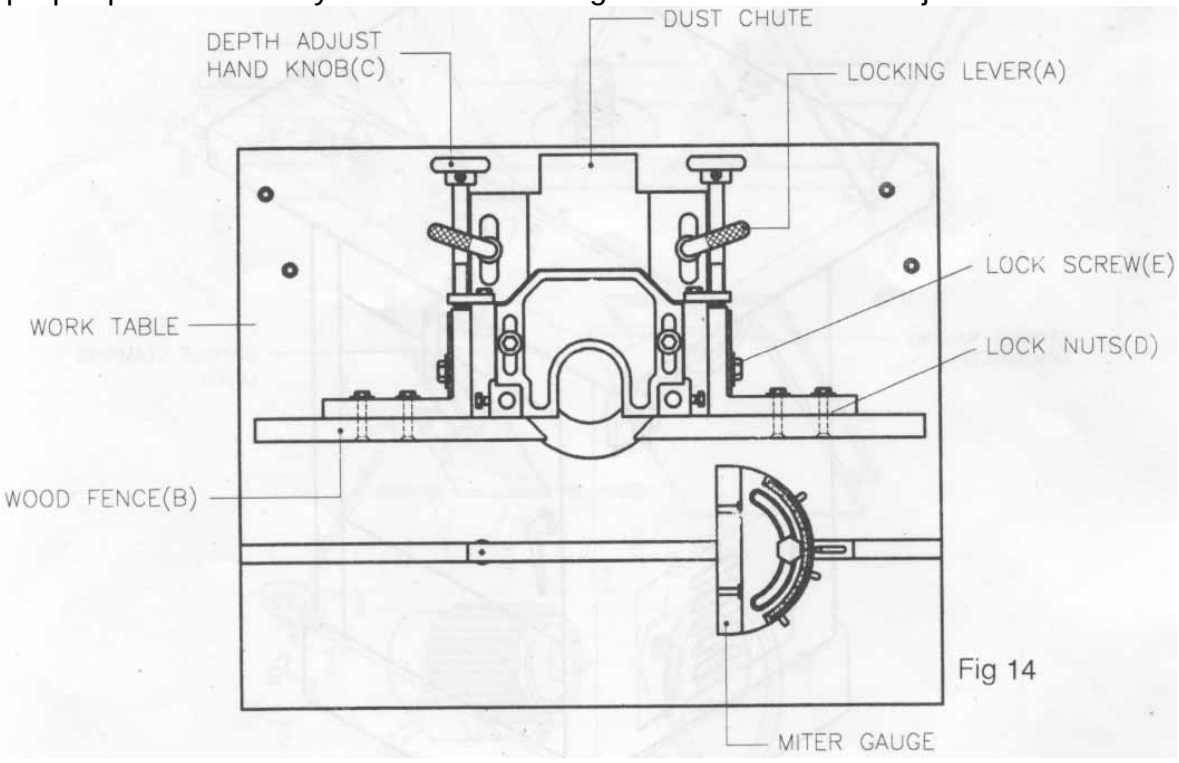


Fig 14

OPERATION

Use the following as a guide to using the shaper fence, collars and starting pin.

Using the Fence

Using the fence when shaping is the safest and most satisfactory method of working. Almost all straight work can be used with the fence.

1. For average work, where a position of the original edge of the work is not touched by the cutter, both the front and rear fences are in a straight line as shown in Fig. 15.
2. When the shaping operation removes the entire edge of the work, the shaped edge will not be supported by the rear fence if both fences are in line. This is common when joining or making a full bead. See Fig. 16. Using scrap, advance the work past the cutter. Turn power off and adjust the rear fence until the shaped portion of the work is supported as shown in Fig. 17. Remove the work piece, start motor, and feed work piece through cutterhead.

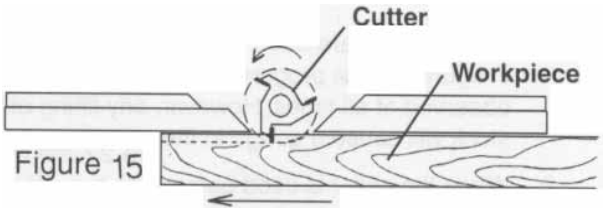


Figure 15

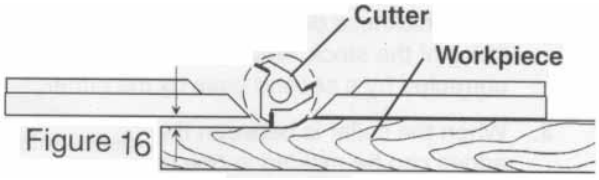


Figure 16

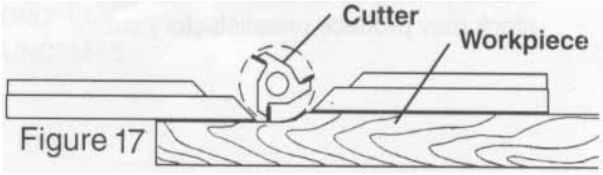


Figure 17

WARNING Always remove work piece before starting machine. Failure to comply may cause work piece to be kicked back which may cause serious injury.

Shaping with Collars & Starting Pin

When shaping with collars and starting pin, the following rules must always be followed for good work and safety in operation:

1. The stock must be fairly heavy in proportion to the cut being made as shown in Fig. 18. Short, light stock, as shown in Fig. 19, should not be shaped using collars.
2. A portion of the edge must remain untouched by the cutterhead in order that the collar will have sufficient bearing surface.
3. The bearing surface on the collar must be adequate to support the work piece. Fig. 20 shows an edge too thin to properly support the work piece.
4. The edge of the work to be shaped must be smooth, as any irregularity on the surface, which rides against the collar, will be duplicated on the molded surface.
5. Collars must be smooth and free from pitch or other substances.

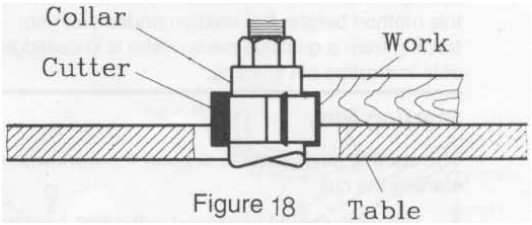


Figure 18

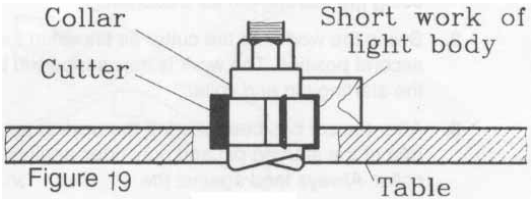


Figure 19

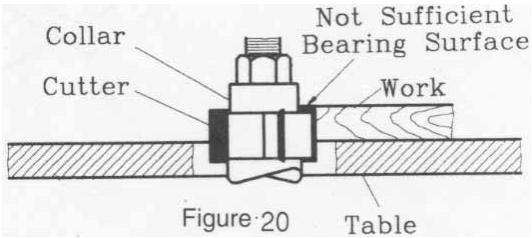


Figure 20

Position of Collars

Collars may be used above, below, or between cutterheads.

1. When collars are used below the cutter as shown in Fig. 21, the progress of the cut can be observed at all times. However, any lifting of the stock will cause a gouge in the cut.
2. When the collar is used above the cutter, as shown in Fig. 22, the cut cannot be seen, but this method has two advantages. Variations in stock thickness do not affect the cut and any lifting of the stock, which reduces the cut, can be corrected by a second pass by the cutter.
3. When the collar is between the cutters, both edges can be molded in one operation, as shown if Fig. 23. A disadvantage to this technique is that any lifting or variation in thickness of the stock may produce unsatisfactory cut.

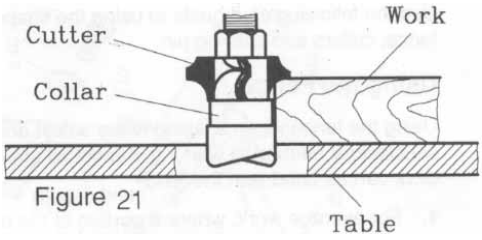


Figure 21

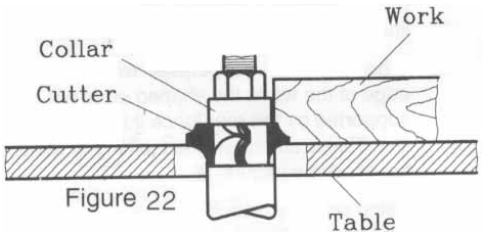


Figure 22

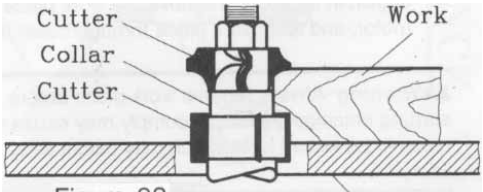


Figure 23

Starting Pin

The starting pin is used to support the work when starting the cut.

! WARNING Only advanced users should attempt using the starting pin. If you have never used this method before, it is recommended you get training from a qualified person who is knowledgeable in starting pin shaping.

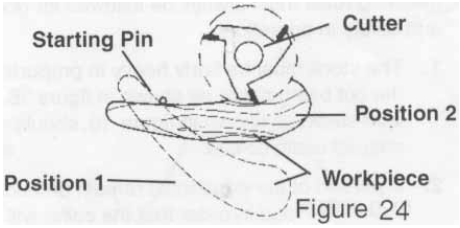


Figure 24

The starting pin is used to support the work when starting the cut.

1. The work should be placed in the first position using the starting pin as a support.
2. Swing the work into the cutter as shown in the second position. The work is now supported by the starting pin and collar.
3. After the cut has been started the work is swung free of the starting pin and only rides against the collar. Always feed against the cutter rotation.

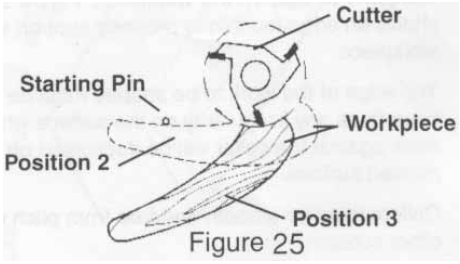


Figure 25

MAINTENANCE

Disconnect the machine from the power source

Regular periodic maintenance on your shaper will ensure its optimum performance. Make a habit of inspecting your machine each time after you use it.

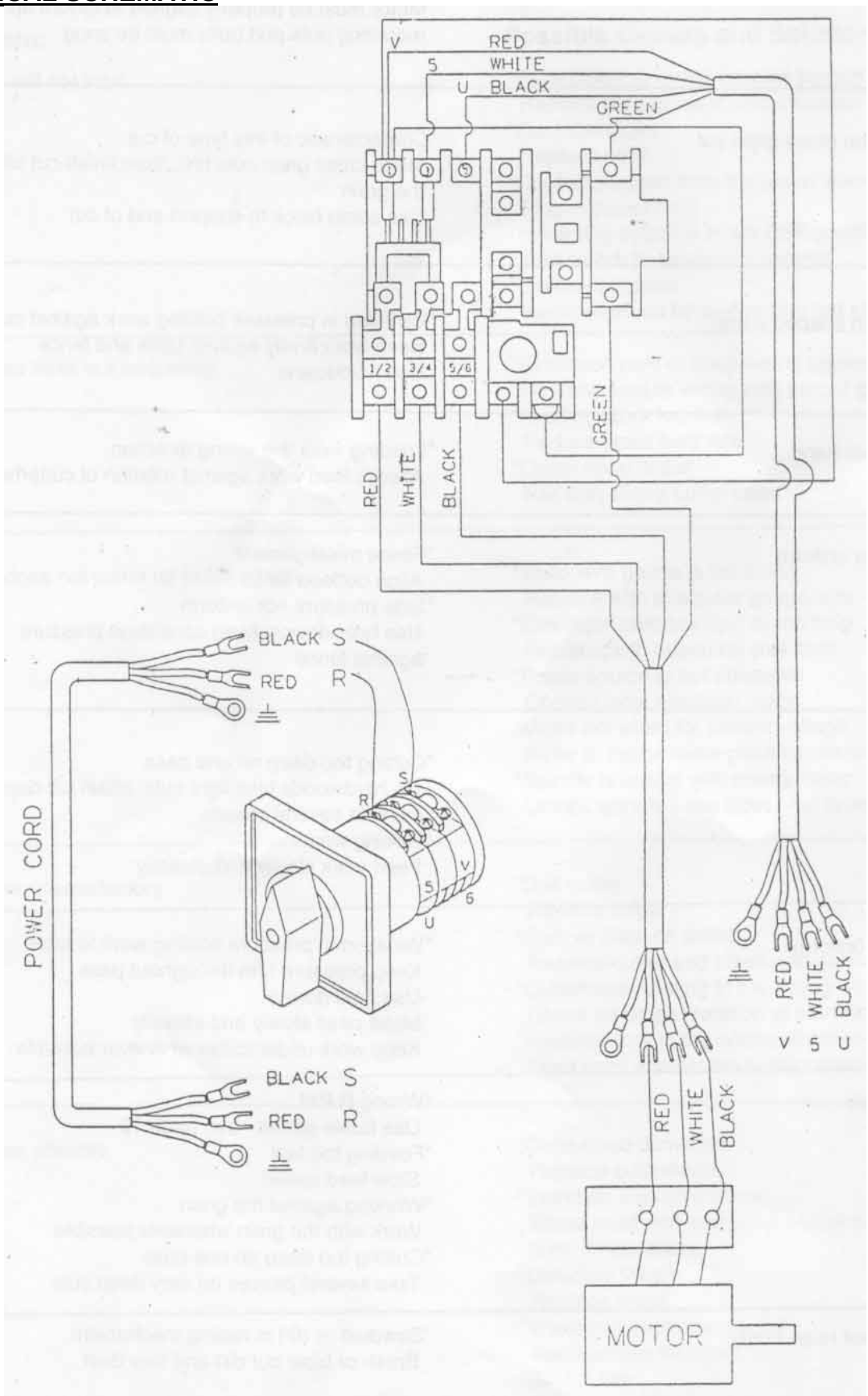
1. Clean the shaper with an air spray gun after daily operation.
2. Lubricate the main spindles periodically with the grease gun to allow free movement when raising or lowering the spindles.
3. The bearings inside the spindle cartridge are sealed and require no further lubrication.

TROUBLESHOOTING

Problem	Possible Causes	Solutions
Shaper will not start	Fuse blown or circuit breaker tripped	Replace fuse or reset circuit breaker
	Cord damages	Replace cord
	Cord unplugged form the power source	Plug in power cord
	Reversing switch is in the OFF position	Turn switch to forward or reverse
	Overload tripped	Reset overload by depressing red stop button
Overload kicks out frequently	Extension cord or shop wiring inadequate size	Replace cord or wiring with proper gauge wire
	Feeding stock too fast	Reduce stock feed rate
	Cutterhead is dull	Use only sharp cutterhead
Cutter does not come up to full speed	Shop wire gauge is too small	Replace with adequate gauge wire
	Extension cord too light or too long	Replace with adequate size cord
	Power source is not adequate	Contact local electrical utility
	Motor not wired for correct voltage	Refer to motor name plate for correct wiring
	Spindle is locked with spindle rotation lock	Unlock spindle
Cuts are unsatisfactory	Dull cutter	Replace cutter
	Gum or pitch on cutter	Remove cutter and clean with solvent
	Cutterhead rotating in the wrong direction	Check for proper rotation at start up
	Feeding work in the wrong direction	Feed work against the cutter rotation
Machine vibrates	Cutterhead damaged	Replace cutterhead
	Stand on uneven surface	Stand must rest solidly on a level surface. Bolt to floor, if necessary
	Defective v-belt	Replace v-belt
	V-belt incorrectly tensioned	Apply proper tension
	Bent pulley	Replace pulley
	Motor mounted improperly	Motor must be properly aligned to mount and mounting nuts and bolts must be snug
Edge splits off on cross grain cut	Characteristic of this type of cut	Make cross grain cuts first, then finish cut with the grain Use scrap block to support end of cut

Raised areas on shaped edge	Variation in pressure holding work against cutter	Keep work firmly against table and fence Use hold downs
Work pulled from hand	Feeding work the wrong direction	Always feed work against rotation of cutterhead
Depth of cut not uniform	Fence misalignment	Align outfeed fence
	Side pressure not uniform	Use hold downs; keep consistent pressure against fence
Work burns	Cutting too deep on one pass	On hardwoods take light cuts; attain full depth of cut with several passes
	Forcing work	Feed work slowly and steadily
Cut height not uniform	Variation in pressure holding work to table	Keep pressure firm throughout pass Use hold downs Make pass slowly and steadily Keep work under cutter whenever possible
Cuts not smooth	Wrong RPM	Use faster speed
	Feeding too fast	Slow feed speed
	Working against the grain	Work with the grain whenever possible
	Cutting too deep on one pass	Take several passes on very deep cuts
Spindle does not raise freely	Sawdust or dirt in raising mechanism	Brush or blow out dirt and saw dust

ELECTRICAL SCHEMATIC



PARTS LIST

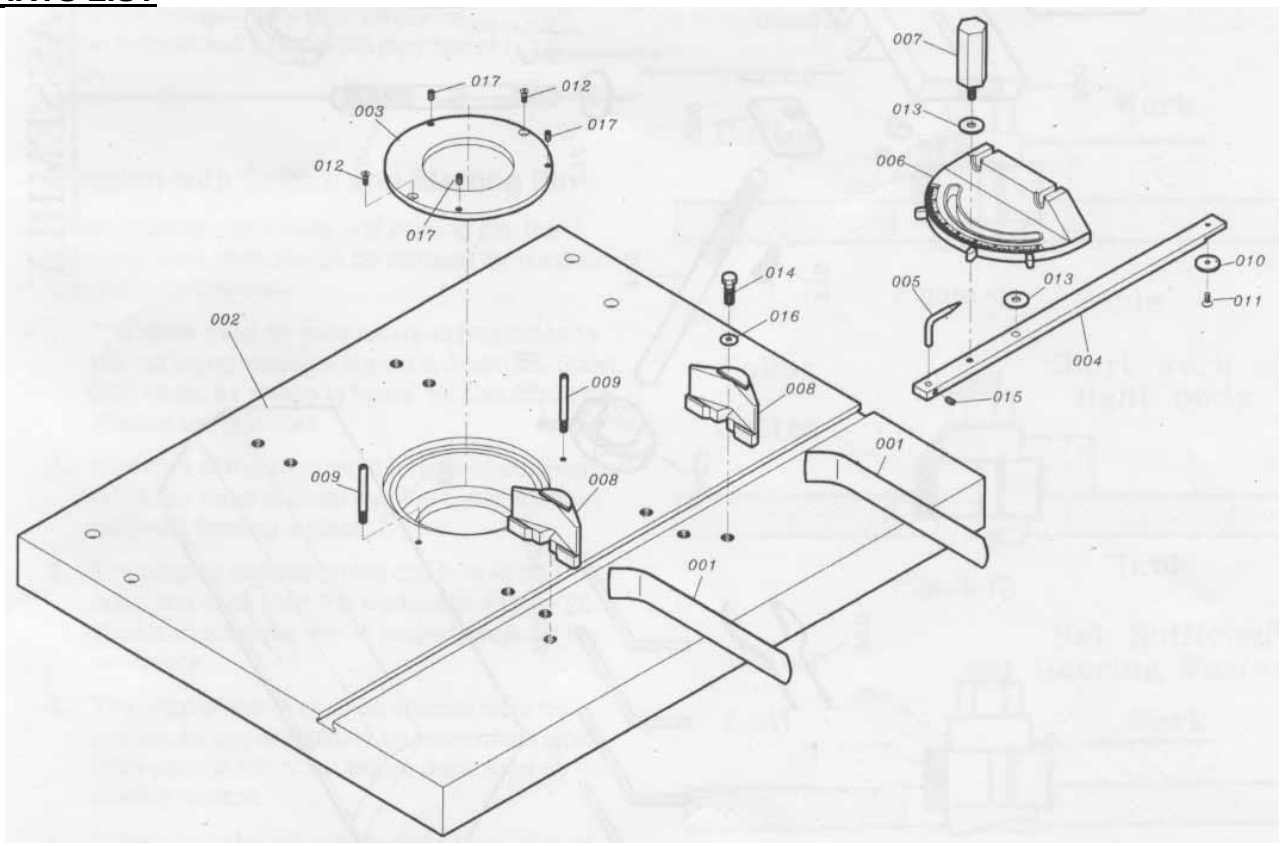
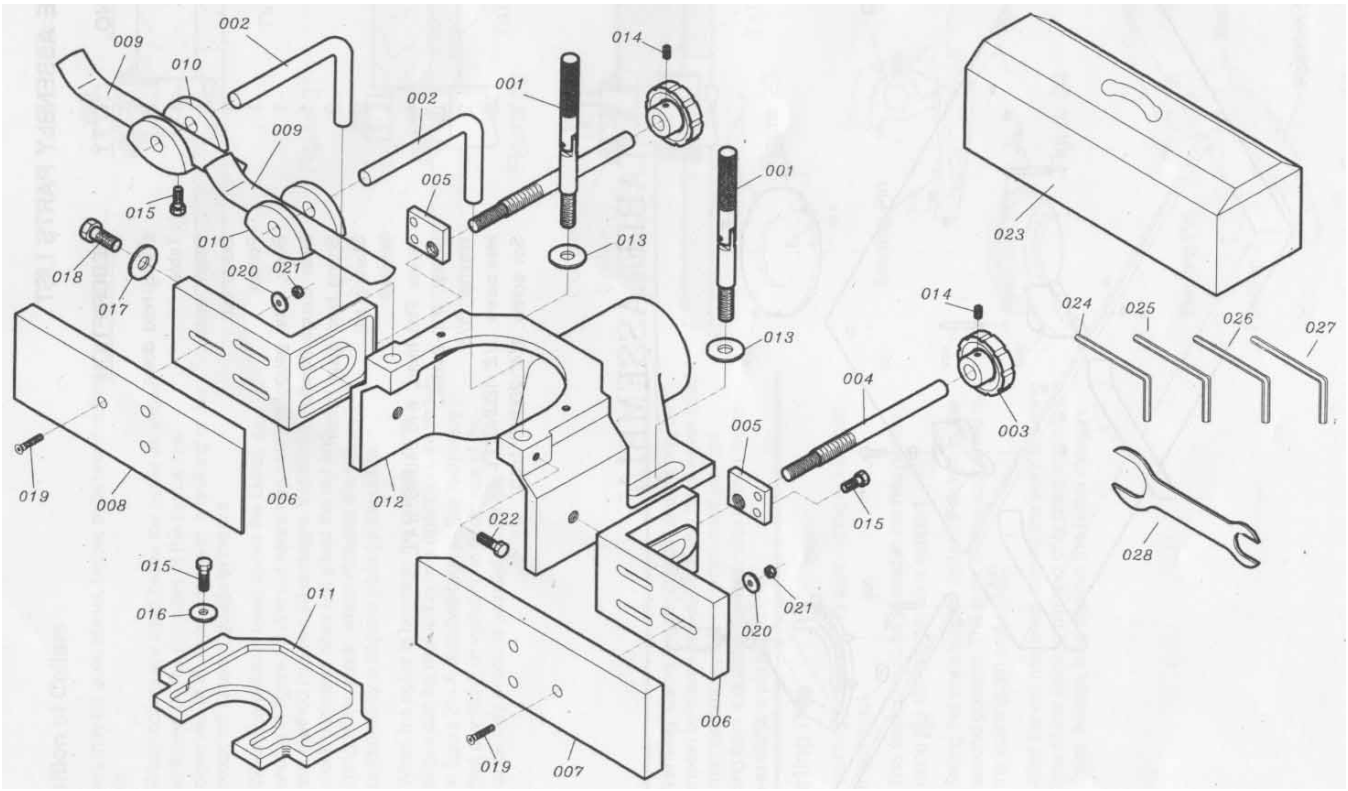


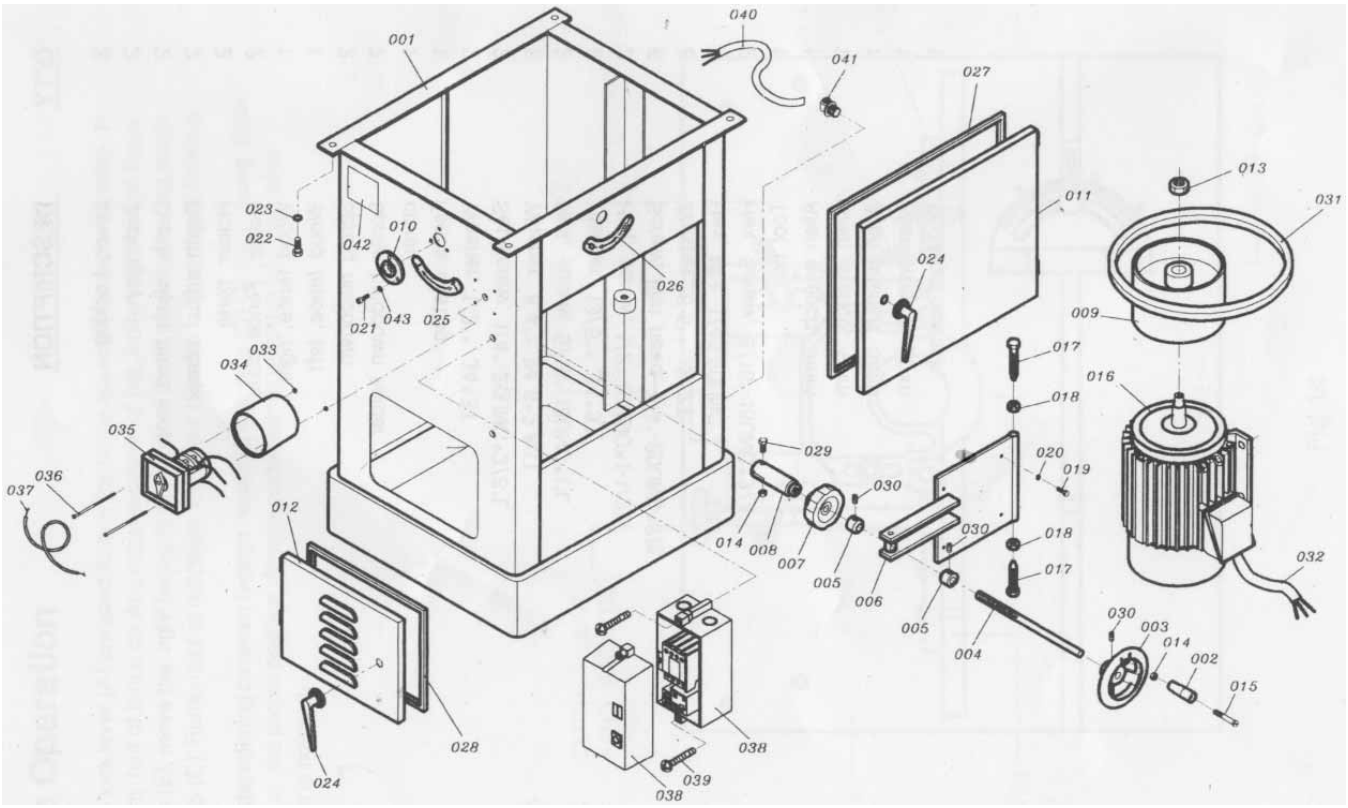
Table Assembly

No	Part Name	Qty	No	Part Name	Qty
T001	Spring Hold Down	2	T009	Starting Pin	2
T002	Table	1	T010	Washer	1
T003	Insert, Table	1	T011	Screw, Flat Head, #10-24UNC*¼"L	1
T004	Guide Bar	1	T012	Screw, #10-24UNC	2
T005	Pointer	1	T013	Washer, ⅝"	2
T006	Body, Miter Gauge	1	T014	Hex. Screw, ½"-12UNC*1"L	2
T007	Miter Gauge Handle	1	T015	Set Screw, ¼"-20UNC*¼"L	1
T008	Spring Hold Down Holder	2			



Fence Assembly

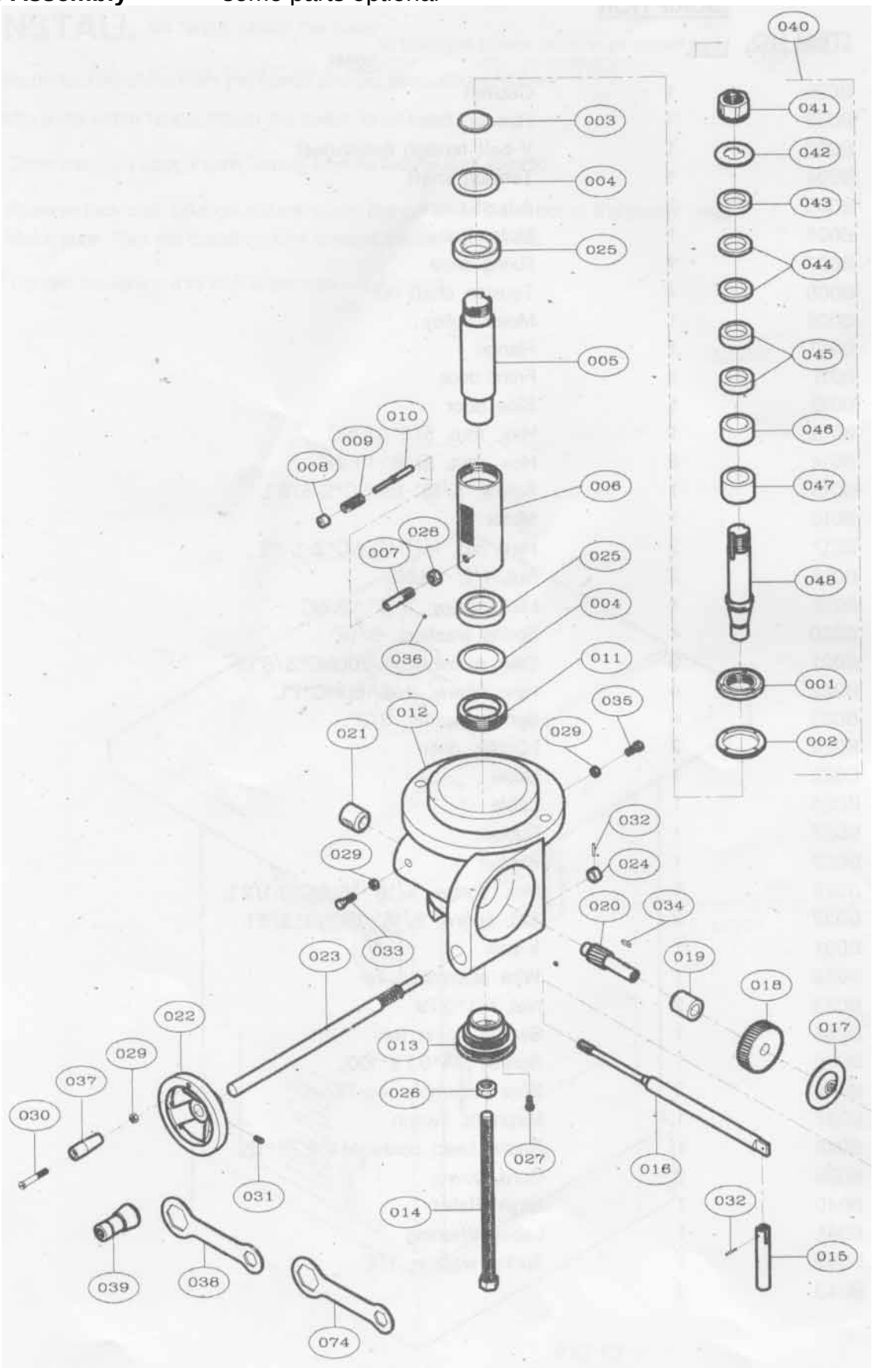
No	Part Name	Qty	No	Part name	Qty
F001	Lever, Locking	2	F015	Washer, 8.4”*24.4”2.83T	8
F002	Jack Stay	2	F016	Hex. Screw, 5/16”-18UNC*1”L	2
F003	Depth Adjust Hand Knob	2	F017	Washer, 1-3/5”*34*3T	2
F004	Depth adjust Screw	2	F018	Hex. Screw, ½”-12UNC*1-½”L	2
F005	Holder, Plate	2	F019	Screw, Flathead ¼”-20UNC*28L	6
F006	Holder, Fence Plate	2	F020	Washer, 6.5”*19*2T	6
F007	Wood Fence, Right	1	F021	Hex. Nut, ¼”-20UNC	6
F008	Wood Fence, Left	1	F022	Hex. Screw, 5/16”-18UNC* ¾”L	2
F009	Spring Hold Down	2	F023	Tool Box	1
F010	Spring Hold Down Holder	2	F024	Allen Wrench, 3mm	1
F011	Cover	1	F025	Allen Wrench, 4mm	1
F012	Fence Casting	1	F026	Allen Wrench, 5mm	1
F013	Washer, ½”*34*3T	2	F027	Allen Wrench, 6mm	1
F014	Set Screw, ¼”-20UNC*⅜”L	2	F028	12-14mm Wrench	1



Base Assembly

No	Part Name	Qty	No	Part Name	Qty
B001	Cabinet	1	B023	Spring Washer,⅜”	4
B002	Handle	1	B024	Handle, Door	2
B003	V-belt Tension Handwheel	1	B025	Label	1
B004	Tension Shaft	1	B026	Label	1
B005	Adjust Piece	2	B027	Rubber	1
B006	Motor Base	1	B028	Rubber	1
B007	Fixing Knob	1	B029	Hex. Screw, 5/16”-18UNC*1-½”L	1
B008	Tension Shaft Nut	1	B030	Set Screw, 5/16”-18UNC*⅜”L	3
B009	Motor Pulley	1	B031	V-Belt	1
B010	Flange	1	B032	Wire Assembly, 4C	1
B011	Front Door	1	B033	Nut, M4*0.79	2
B012	Side Door	1	B034	Switch Cover Rev.	1
B013	Hex. Nut, ⅝”-11UNC	1	B035	Screw, M4*0.79*100L	1
B014	Hex. Nut, 5/16”-18UNC	2	B036	Wire Assembly, 4C-75cm	2
B015	Screw, 5/16”-18UNC*2-⅝”L	1	B037	Magnetic Switch	1
B016	Motor	1	B038	Roundhead Screw M4*0.78*12L	1
B017	Hex. Nut, ½”-12UNC*2-½”L	2	B039	Cord, Power	2
B018	Nut, ½”-12UNC	2	B040	Strain Relief	1
B019	Hex. Screw, 1/16”-18UNC	4	B041	Label, Warning	1
B020	Spring Washer, 5/16”	4	B042	Spring Washer, ¼”	1
B021	Cap Screw, ¼”-20UNC*⅝”L	3	B043	Washer	3
B022	Hex. Screw, ⅜-16UNC*1”L	4			

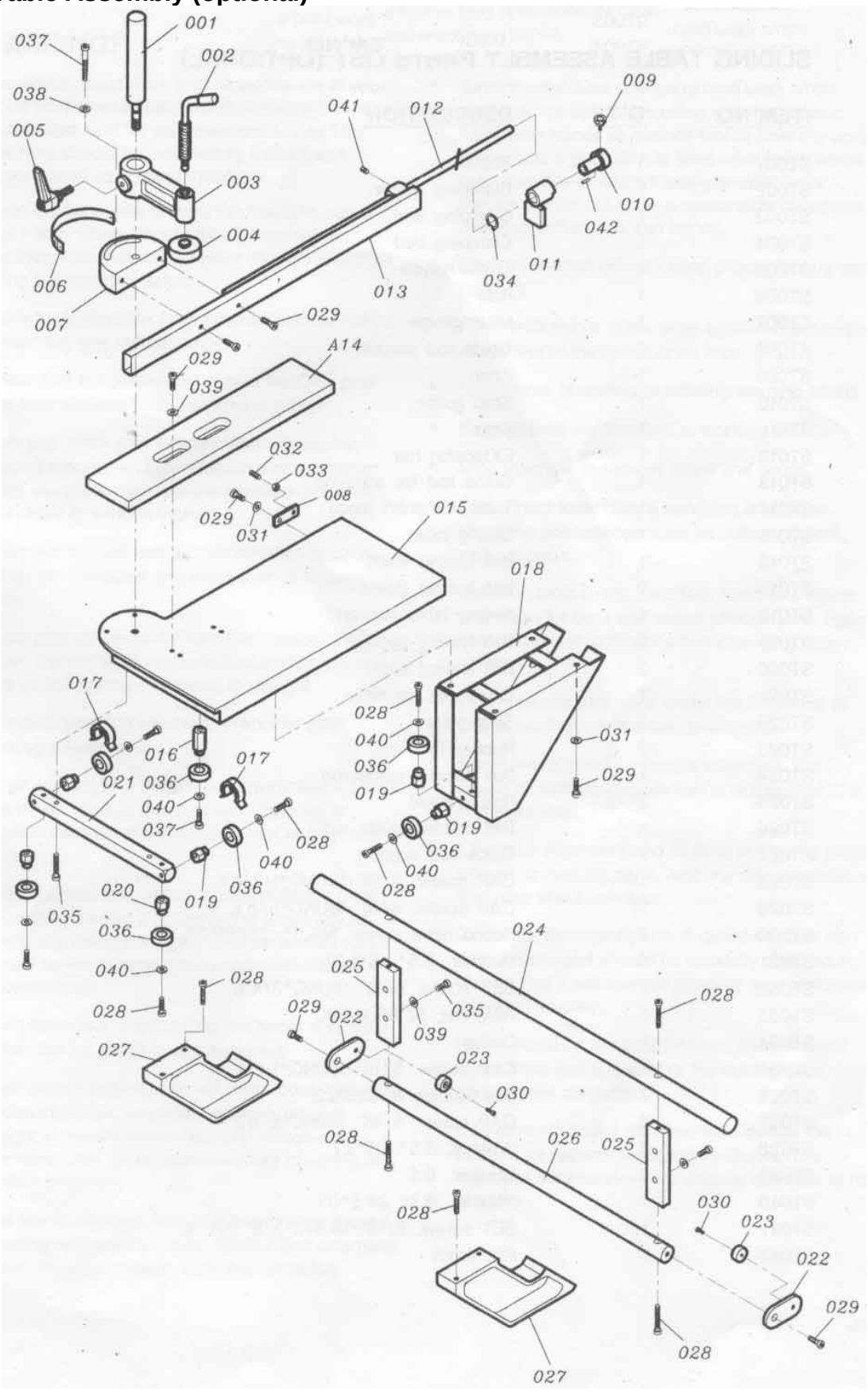
Spindle Assembly *some parts optional



Spindle Assembly Parts List *some parts optional

No	Part Name	Qty	No	Part Name	Qty
S001	Spindle Nut	1	S039	½" Collet	1
S002	Upper Cartridge nut	1	S040	Arbor Assembly, 1-¼"	1
S003	Spring Washer	1	S041	Locking Nut, 1-¼" Arbor	1
S004	Spring Washer	2	S042	Gear Washer for 1-¼" Arbor	1
S005	Spindle	1	S043	Collar, 1-¼"*⅜"L	1
S006	Cartridge	1	S044	Collar, 1-¼"*¼"L	2
S007	Spindle Lock Screw	1	S045	Collar, 1-¼"*½"L	2
S008	Lock Handle	1	S046	Collar, 1-¼"*¾"L	1
S009	Spring	1	S047	Collar, 1-¼"*1"L	1
S010	Lock Shaft	1	S048	Arbor, 1-¼"	1
S011	Lower Cartridge Nut	1	S049	Arbor Assembly 1"	1
S012	Cartridge Housing	1	S050	Locking Nut, 1" Arbor	1
S013	Pulley, Spindle	1	S051	Gear Washer, 1" Arbor	1
S014	Draw Bar	1	S052	Collar, 1"*⅜"L	1
S015	Clamping Lever	1	S053	Collar, 1"*¼"L	2
S016	Locking Rod	1	S054	Collar, 1"*½"L	2
S017	Cover, Gear	1	S055	Collar, 1"*¾"L	1
S018	Drive Gear	1	S056	Collar, 1"*1"L	1
S019	Front Locking Nut	1	S057	Arbor 1"	1
S020	Gear Shaft	1	S058	Arbor Assembly, ¾	1
S021	Rear Locking Nut	1	S059	Locking Nut, ¾"	1
S022	Hand Wheel	1	S060	Gear Washer, ¾" Arbor	1
S023	Worm Shaft	1	S061	Collar, ¾"*¼"L	1
S024	Worm Collar	1	S062	Collar, ¾"*⅜"L	1
S025	Ball Bearing, #6008	2	S063	Collar, ¾"*½"L	1
S026	Hex. Nut, ⅝"-11UNC	1	S064	Collar, ¾"*¾"L	1
S027	Cap Screw, M6*1.0P*20L	3	S065	Collar, ¾"*1"L	1
S028	Hex. Nut, ½"-20UNC	1	S066	Arbor, ¾"	1
S029	Hex. Nut, 5/10"-18UNC	3	S067	Arbor Assembly, ½"	1
S030	Screw, 5/16"-18UNC	1	S068	Locking Nut, ½"	1
S031	Set Screw, 5/16"-18UNC*¾"L	1	S069	Gear Washer, ½" Arbor	1
S032	Pin, 3*¾"L	2	S070	Collar, ½"*¼"L	1
S033	Hex. Screw, 5/16"-18UNC*1"L	1	S071	Collar, ½"*⅜"L	1
S034	Key, 4*4*15	1	S072	Collar, ½"*½"L	1
S035	Hex. Screw, 5/16"-18UNC*¾"L	1	S073	Collar, ½"*¾"L	1
S036	Steel Ball	1	S074	Arbor, ½"	1
S037	Handle, Wheel	1	S075	Bone Wrench, 1-¼"	1
S038	Bone Wrench	1			

Sliding Table Assembly (optional)



Sliding Table Assembly (Optional)

No	Part Name	Qty	No	Part Name	Qty
ST001	Shaft	1	ST022	Stop Plate	2
ST002	Clamping Screw	1	ST023	Rubber Fit	2
ST003	Clamping Arm	1	ST024	Ball Bearing Guide Rod	1
ST004	Clamping Pad	1	ST025	Rod Bracket	2
ST005	Crank Handle	1	ST026	Ball Bearing Guide Rod	1
ST006	Rule	1	ST027	Guide Rod Support	2
ST007	Miter Gauge	1	ST028	Cap Screw, 5/16”-18UNC*1¾”L	14
ST008	Guide Rod Support	1	ST029	Cap Screw, 5/16”-18UNC*⅝”L	11
ST009	Knob	1	ST030	Roundhead Screw, M4.5*-.75*½”L	2
ST010	Stop Guide	1	ST031	Washer, 8.5*16*1.2T	5
ST011	Stop	1	ST032	Set Screw, 5/16”-18UNC*¾”L	1
ST012	Extension Bar	1	ST033	Hex. Nut, 5/16”-18UNC	1
ST013	Guide Rod for Squaring	1	ST034	C-Ring	1
ST014	Table for Short Piece	1	ST035	Cap Screw, 5/16”-18UNC*1-¼”	10
ST015	Sliding Table	1	ST036	Ball Bearing #6202ZZ	7
ST016	Ball Bearing Shaft	1	ST037	Cap Screw, 5/16”-18UNC*2-½”	3
ST017	Ball Bearing Guard	2	ST038	Washer, 8.5*23*2T	8
ST018	Sliding Table Support	1	ST039	Washer, 8.5	4
ST019	Ball Bearing Shaft	6	ST040	Washer, 8.5*24.5*3T	7
ST020	Ball Bearing Shaft	2	ST041	Set Screw, 5/16”-18UNC*⅜” pin, 4	1
ST021	Guide Bar for Table	1	ST042	Pin, 4mm	1

SLIDING TABLE (OPTIONAL)

The unit consists of a cast iron body, sliding on two rods fastened to the work table by means of support with four ⅜” Cap screws.

For fitting the sliding table proceed as follows:

1. Fit the rod support (A) to the work table by four 5/16”-18UNC Cap screws (B).
2. Loosen Cap screw on stop plate (C) and turn the stop plate to right side.
3. Fit the sliding table to rod support by bearings slides on two rods.
4. Lock stop plate (C) to left side on both rod end to prevent the sliding table from moving out.